

WHAT IS CLAIMED IS:

1. A method for identifying a compound with a selected activity, comprising:
- 5 (a) determining a change in the expression profile of a selected set of genes in the presence and absence of a first compound having a selected activity,
- (b) determining a change in the expression profile of the selected set of genes of step (a) in the presence and absence of a second
- 10 compound,
- (c) comparing said determined change in expression profile in step (b) with that in step (a)
- wherein a determination in step (c) of the same or similar change in said expression profile identifies said second compound as a compound
- 15 having said selected activity.
2. The method of claim 1 wherein said selected activity is antineoplastic activity.
- 20 3. The method of claim 1 wherein said selected set of genes is present in a cell.
4. The method of claim 1 wherein said expression is transcription.
- 25 5. The method of claim 1 wherein said change in expression profile is determined by determining synthesis of RNA.
6. The method of claim 1 wherein said change in expression profile is determined by determining polypeptide synthesis.

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7. The method of claim 1 wherein said selected activity is inducing a physiological change in a cell.

8. The method of claim 1 wherein said selected activity is therapeutic activity.

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9. The method of claim 1 wherein said selected activity is enzyme inhibitory activity.

10. The method of claim 1 wherein the compound of step (a) is a topoisomerase II inhibitor.

11. The method of claim 1 wherein the compound of step (a) is a member selected from the group consisting of Camptothecine (S, +), beta-Lapachone, Suramin sodium salt, Aclacinomycin A from Streptomyces galilaeus, Mitoxantrone dihydrochloride, Etoposide, Doxorubicin hydrochloride, Aurintricarboxylic acid, Epirubicin hydrochloride, and m-AMSA hydrochloride.

12. The method of claim 3 wherein the cell is a colon cell.

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13. The method of claim 12 wherein said cell is a cancer cell.

14. The method of claim 3 wherein the cell is a recombinant cell engineered to express said selected set of genes.

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15. The method of claim 14 wherein said recombinant cell does not express said selected set of genes absent said engineering.

16. The method of claim 3 wherein said selected set of genes is part of the genome of said cell.

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17. A related gene set comprising genes whose polynucleotide sequences correspond to the sequences of SEQ ID NO: 1-12.

18. The method of claim 1 wherein said determined genes are in
5 the gene set of claim 17.

19. A compound identified as having therapeutic activity by the method of claim 1.

10 20. A compound identified as having anti-neoplastic activity by the method of claim 1.

21. A compound identified as having enzyme inhibitory activity by the method of claim 1.

15 22. A method for treating a disease comprising administering to an animal afflicted with said disease of a therapeutically effective amount of the compound of claim 19.

20 23. A method for treating cancer comprising administering to an animal afflicted with cancer of a therapeutically effective amount of the compound of claim 20.

24. A method for identifying a related gene set comprising:
25 contacting a cell with each of a plurality of compounds having common biological activity and determining a change in the expression of a plurality of genes of said cell as a result of said contacting where contacting with each of said plurality of compounds results in the same relative changes of expression of said genes and thereby identifying said genes as a related gene set.

30 25. The method of claim 24 wherein said biological activity is therapeutic activity.

26. The method of claim 24 wherein said biological activity is enzyme inhibitory activity.

27. The method of claim 24 wherein said biological activity is anti-
5 neoplastic activity.

28. The method of claim 24 wherein said plurality of compounds are topoisomerase II inhibitors.

10 29. The method of claim 24 wherein said plurality of compounds comprise members selected from the group consisting of Camptothecine (S, +), beta-Lapachone, Suramin sodium salt, Aclacinomycin A from Streptomyces galilaeus, Mitoxantrone dihydrochloride, Etoposide, Doxorubicin hydrochloride, Aurintricarboxylic acid, Epirubicin hydrochloride, and m-AMSA
15 hydrochloride.

30. A method for producing test data with respect to a biological activity of a compound comprising:

(a) contacting a cell with each of a plurality of compounds exhibiting
20 similar biological activity and determining a change in the expression of a plurality of genes of said cell as a result of said contacting whereby the relative changes in expression of said genes together forms a gene expression profile;

(b) contacting a compound different from that of (a) with the determined
25 genes of (a) and determining a change in expression of said determined genes as a result of said contacting whereby the relative changes in expression of said determined genes together forms the gene expression profile of (a) thereby identifying a biologically active compound; and

(c) producing test data with respect to the gene modulating activity
30 of said compound based on the gene expression profile indicating biological activity.

31. A recombinant cell expressing a related gene set identified by the method of claim 24.

32. A recombinant cell expressing the related gene set of claim 17.